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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,586	10/17/2005	Ho-yeul Choi	NEK0018US	1511
23413 7590 01/13/2010 CANTOR COLBURN, LLP 20 Church Street 22nd Floor Hartford, CT 06103				
EXAMINER VETTER, ROBERT A				
ART UNIT		PAPER NUMBER		
1792				
NOTIFICATION DATE		DELIVERY MODE		
01/13/2010		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptopatentmail@cantorcolburn.com

Office Action Summary

Application No.

10/553,586

Applicant(s)

CHOI ET AL.

Examiner

ROBERT VETERE

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 14-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/22)
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date: _____

DETAILED ACTION

Examiner's Comments

An amendment, amending claims 4-6, 10 and 17, was received and entered on 9/29/2009.

Claims 14-17 remain withdrawn pursuant to an election on 4/24/2009.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi et al. (US 2003/0105222) in light of Izaki et al. (US 3,970,629).

Claims 1-7: Choi teaches a method of making a styrene-butadiene latex for coating paper (Abst.) comprising the steps of: preparing a core of styrene butadiene (¶¶ 0027) and forming multiple coatings around the core (¶¶ 0028-0029) wherein the core and shell each are formed by emulsion polymerization (see, e.g., ¶ 0023) with a composition comprising 20-55 parts by weight 1,3-butadiene, 45-80 parts of styrene, 1-15 parts of ethylene unsaturated acid monomer, 0.1-20 parts of cyanide vinyl monomer, 0.1-30 parts of a copolymerizable monomer and 0.1-10 parts of a chain transfer agent such as a mercaptan with 6-17 carbon atoms (¶¶ 0042, 0046, 0049). In the case where the claimed ranges overlap or lie inside ranges disclosed by the prior art "a prima facie case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the compositions claimed by applicant because Choi teaches ranges which encompass these compositions.

Choi also teaches that the gel content and molecular weight of the latex is adjusted with the chain transfer agent (¶ 0049), but fails to expressly teach that this agent is added singly after the coating steps. Izaki, however, a method of forming a copolymer latex for use as a paper coating (Abst.) wherein mercaptan is used as a chain transfer agent to adjust the molecular weight and gel content of the latex

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(3:51-4:8). Izaki further teaches that it is known in the art that the chain transfer agent may be added singly as opposed to introducing it with the monomer composition (4:4-8) in order to adjust the molecular weight and gel content of the formed latex shell. With respect to the limitation that the chain transfer agent is added after the step of forming the shell, Izaki further explains that the chain transfer agent is added to the formed copolymer, therefore, it is added after the coating step because the copolymer doesn't form until the coating step has completed (see, e.g., 3:51-4:8) and also teaches that the chain transfer agent is added when a conversion rate is below 95% (see, e.g., 4:8-32). In addition, Izaki teaches that the amount of chain transfer agent can be adjusted based on the conversion ratio (4:8-32). "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 105 USPQ 233, 235 (CCPA 1955). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have introduced the chain transfer agent singly, as taught by Izaki, with the predictable expectation of success because Izaki teaches that the introduction of the chain transfer agent singly is a known and suitable alternative to introducing the chain transfer agent with the monomer composition and further because Izaki teaches that the chain transfer agent is used to adjust the gel content of the formed copolymer.

Claim 8: Choi further teaches that the ethylene unsaturated acid monomer is methacrylic acid (¶ 0045).

Claim 9: Choi further teaches that the cyanide vinyl monomer is acrylonitrile (¶ 0047).

Claim 10: Choi further teaches that the copolymerizable monomer is butylmethacrylate (¶ 0048).

Claim 11: Choi further teaches that the gel content can be optimized based on the composition of the monomers used (¶ 0013). "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 105 USPQ 233, 235 (CCPA 1955). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have adjusted the gel content of the latex, as taught by Choi, by adjusting the amount of each monomer used in the compositions in order to provide the desired gel content with the predictable expectation of success.

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Claim 12: Choi also teaches that the glass transition temperature of the core and shell latexes are between -20 and 25°C (¶ 0050). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected a composition for the core which provided a glass transition temperature of -10 to 25°C and similarly selected for the shell a composition which provided a glass transition temperature of -20 to 25°C with the predictable expectation of success.

Claim 13: Choi also teaches that the core diameter is 70 nm (¶ 0057) and the core-shell diameter is 100-150 nm (¶ 0050). "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 105 USPQ 233, 235 (CCPA 1955). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed particles of 130-150 nm in the method of Choi because Choi teaches that the particles formed may be 100-150 nm.

Response to Arguments

3. Applicant's arguments filed 9/29/2009 have been fully considered but they are not persuasive.

Applicant argues that the claim amendments in claim 1 overcome the rejection under Choi and Izaki. This is not persuasive. As explained above, Izaki teaches that the chain transfer agent is added when the conversion ratio is below 95% and further explains that the amount of chain transfer agent added is tied to the conversion ratio.

Applicant also argues that the claims limit the addition of the chain transfer agent, singly, to after the multiple shell polymerization step is completed (see p. 7 of applicant's response). This is not persuasive. The current claim language uses the term "comprising" which does not limit the order of performing steps. Therefore, the current claim language does not contain any limitation that the chain transfer agent is only added single after the multiple shell polymerization step is completed.

Additionally, applicant's cite the Written Opinion and International Search report of the parent PCT as evidence against the Choi reference. This is not persuasive. This Written Opinion is directed to

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the Choi reference alone and not to the combination presented in this action. Furthermore, the claims currently presented are different from those presented in the parent PCT.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT VETERE whose telephone number is (571)270-1864. The examiner can normally be reached on Mon-Fri 9-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Robert Vetere/
Examiner, Art Unit 1792

/Michael Cleveland/

Supervisory Patent Examiner, Art Unit 1792